



The International Fancy Guppy Association



Dedicated to Promoting The Fancy Guppy Hobby

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Protein Nutrition

By Rusty Strader

As we all know, protein is a necessary ingredient in all the foods that we feed to our guppies. Most of us look at the analysis of the foods that we feed to see what the protein percentage is, but may not realize that there is a wide variation in the quality of proteins and the actual amount of usable protein.

Why is protein consumption so necessary? Protein is the basic structural material from which all body material is formed. muscles, nerves, blood cells, and all other tissues are composed of a large percentage of protein. The dry matter of bones is even composed of over 1/3 protein.

What is protein? Protein is a complex organic nitrogenous compound made up of amino acids. The important thing to remember here is that amino acids are the building blocks of proteins. When animals digest protein, they break the proteins down to amino acids and recombine the amino acids into the type of proteins that the body needs.

When proteins are broken down by digestion, there can be 20-25 amino acids present. In humans, there are 22 known amino acids. Eight of these being essential amino acids and the rest being nonessential. An essential amino acid is one that cannot be synthesized by the body and must be present in the protein feed. A nonessential amino acid is one that can be formed from other amino acids. I can only assume that guppies require about the same number of essential amino acids as humans.

What happens when a food does not contain all of the essential amino acids? If there is an essential amino acid missing in the digestive tract, then the amino acids are used as a source of energy instead of making protein. Essential amino acids such as Methionine and Lysine are routinely added to fish foods to ensure that there are adequate levels of every essential amino acid present.

Why do high quality foods usually contain many ingredients? Each type of food ingredient contains different levels of amino acids, minerals, vitamins and other substances. Each ingredient is usually added at different concentrations so that there is a near equal balance of essential amino acids and enough nonessential amino acids. Vitamins and minerals are then added to supplement any deficient levels.

What is crude protein? Crude protein is given on the analysis of feeds and this number is very misleading. Crude protein content can be quite a bit different than actual protein content. Crude protein content is determined by a Kjeldahl test. The test determines the nitrogen content of a feed and assumes that 100% of the nitrogen becomes protein. The nitrogen content is multiplied by 6.25 to get the crude protein content. Some ingredients like gelatin are high in nitrogen and add to the crude protein content, but do not have a biological value.

How can one determine if their food is high quality? When looking at the ingredients, the first thing to remember is that the ingredients are listed in the order of abundance. The ingredient listed first is most abundant. One should look for high quality ingredients such as fish meal. High quality ingredients have higher levels of digestible and usable proteins. Ingredients such as feather meal may have a crude protein content over 80%, but should be avoided because of low digestibility and very low levels of certain essential amino acids. A food that uses high quality ingredients and has an analysis of crude protein is what we should be looking for.

My opinion is that most high quality flake foods supply sufficient amounts of essential and nonessential proteins. I feel that feeding different flake foods every few hours may have little benefit from a protein standpoint. When most livestock digest food, the body combines what amino acids it can into proteins in about a two hour period. After that period of time, the remaining protein is converted to energy. If an essential amino acid is missing or deficient in the original feeding, the amino acids will be mainly converted into energy and not protein. Feeding a missing amino acid several hours later would be too late. Because guppies have short digestive tracts, the time that it takes to utilize and combine amino acids into proteins is probably much less than two hours. If one is concerned about the protein content and quality of their foods, then it would be a good idea to feed a blend of several flake foods at one time to increase the chance that sufficient levels of all essential amino acids are present at one feeding.

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Filtration



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